

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Yuhang Zhai
Student number	6005209

Studio		
Name / Theme	Complex City	
Main mentor	Marcin Dabrowski	Spatial planning and strategy
Second mentor	Claudiu Forgaci	Urban design
Argumentation of choice of the studio	<p>Growing up in China, I have developed a deep interest in the complex challenges and transformations facing Chinese cities, particularly in the context of rural development and the relocation of industrial zones. My hometown, Heilongjiang Province, once a thriving industrial hub and a major oil producer, now grapples with the lasting impacts of industrial decline. The privatization of state-owned enterprises and subsequent economic reforms led to widespread factory closures, job losses, population decline, and economic stagnation.</p> <p>In the Complex City studio, I can focus on addressing urban shrinkage, economic transition, and spatial planning. Its emphasis on integrating interdisciplinary approaches to tackle urban challenges offers a unique platform to explore and develop strategies for revitalizing shrinking cities like those in Heilongjiang.</p>	

Graduation project	
Title of the graduation project	Resilient Suihua: Adaptive Strategies for Sustainable Urban Shrinkage
Goal	
Location:	China, Heilongjiang Province, Suihua
The posed problem, research questions and	[Urban Shrinkage population loss]
design assignment in which these results	How can spatial planning apply the concept of smart shrinkage to explore the adaptive reuse of land and buildings, enhancing Suihua's resilience in the context of future population decline? The task involves analyzing the essence of Suihua's urban shrinkage, highlighting

	<p>the need for proactive planning in response to this issue. The project will include a smart shrinkage guide map detailing various land uses after shrinkage, a master plan for spatial organization, strategies for adaptive reuse and industrial transformation, a timeline for project implementation, and suggestions for policy development and investment to support sustainable development in Suihua.</p>
Process	
Method description	
<p>Literature Review, Document Analysis, Research by GIS/mapping, Demographic Statistics Analysis, Reference Case Study, Public Media, Field Trip(Street Interviews and Photograph), Stakeholder Analysis</p>	

Literature and general practical references

Anand, S., & Ravallion, M. (1993). Human development in poor countries: on the role of private incomes and public services. *Journal of economic perspectives*, 7(1), 133-150.

Popper, D. E., & Popper, F. J. (2002). Small can be beautiful. *Planning*, 68(7), 20-20.

Rhodes, J., & Russo, J. (2013). Shrinking 'Smart'? Urban Redevelopment and Shrinkage in Youngstown, Ohio. *Urban Geography*, 34(3), 305–326.
<https://doi.org/10.1080/02723638.2013.778672>

Ryan, B. D., & Gao, S. (2019). Plan implementation challenges in a shrinking city: A conformance evaluation of Youngstown's (OH) comprehensive plan with a subsequent zoning code. *Journal of the American Planning Association*, 85(4), 424-444.

Shah, A. (2012). Public services and expenditure need equalization: reflections on principles and worldwide comparative practices. *World Bank Policy Research Working Paper*, (6006).

Dempsey, N., & Jenks, M. (2010). The future of the compact city. *Built Environment* (1978-), 36(1), 116-121.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

My graduation project focuses on urban shrinkage in Suihua, which involves the analysis and intervention of social issues, urban spatial and environmental challenges, and economic development concerns, through the transformation process enabled by urban shrinkage. The project also extensively incorporates political analysis and application. This is directly related to the sub-theme "Complex Regions in Transformation" of the Complex City studio. The project addresses the challenges of urban shrinkage through spatial planning, adaptive reuse, and industrial transformation. These objectives align with the content of my Urbanism master's program, ranging from the Q1 phase, which focused on storytelling in urban planning, to the Q2 phase, which covered neighborhood regeneration planning and evaluation, and finally to the Q3 phase, which dealt with regional industrial transformation planning.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The social relevance of my project lies in addressing the multifaceted challenges that come with urban shrinkage, a structural issue impacting various regions worldwide, including Suihua. Shrinking cities often represent areas with limited livability and economic stability, making it essential to prioritize the needs of these communities on local, national, and even international agendas. By focusing on the needs of Suihua's residents, my project advocates for inclusive planning strategies that aim to improve quality of life.

Moreover, the vacant land resulting from shrinkage presents valuable opportunities for exploring innovative, sustainable land uses. Repurposing this space for green infrastructure, community areas, and other non-traditional uses not only enhances the livability of shrinking areas but also contributes to sustainable development goals, which are of broad societal relevance. Creating planning principles and design tools that enable these transformations is essential for ensuring the social, ecological, and economic resilience of Suihua in the long term.

The scientific relevance of my project lies in utilising geographic information system (GIS) data, demographic statistics, and economic indicators sourced from government databases and academic research to analyze spatial patterns and population dynamics associated with urban shrinkage. By examining vacancy rates, land use changes, and population outflows, the project leverages these objective data sources to inform strategic planning for shrinkage .

Limited research on adaptive planning models: Most urban planning models are growth-oriented and there is limited research on adaptive frameworks specifically designed to manage urban shrinkage and decline.

Insufficient case studies and comparative analyses: While some case studies exist, particularly in Europe and the United States, there is a lack of comparative studies across different cultural, economic and geographic contexts, especially in developing countries or regions with unique patterns of urbanisation